WILDLIFE BIOLOGICAL EVALUATION

FOR THE

Big Six Range AMP EIS

Bighorn National Forest

All Sensitive Species Except Bighorn Sheep

2011

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Introduction

Threatened and endangered species are managed under the authority of the Endangered Species Act (ESA) (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). The ESA requires federal agencies to ensure that all actions are not likely to jeopardize the continued existence of any threatened or endangered species. In 1996, the U.S. Fish and Wildlife Service, which administers the ESA, revised the candidate list to define candidate species as those species for which "there are sufficient information on their biological status and threats to propose them as threatened or endangered" under the Act. Section 7 of the ESA provides direction to federal agencies regarding consultation requirements on any projects where an effect to threatened or endangered species may occur, and includes the preparation of a Biological Evaluation.

A Biological Evaluation (BE) provides a process to review all Forest Service planned, funded, executed or permitted programs and activities for possible effects on threatened, endangered, proposed or sensitive species (TES) (Forest Service Manual 2672.4). BEs are intended to help ensure that Forest Service actions do not contribute to a loss of viability or any native or desired non-native plant or animal species or contribute to trends toward Federal listing of any species. They provide a process and standard to ensure that TES species receive full consideration in the decision-making process (FSM 2672.41). Further management requirements can be found in the Bighorn National Forest Land and Resource Management Plan. Forest Service sensitive species are selected by the Regional Forester, and are species for which viability is of concern.

The effects analysis in the BE is required to address any direct, indirect, and cumulative effects of an action on threatened or endangered species or their critical habitat (50 Code of Federal Regulations [CFR] 402.02) and on sensitive species or their habitat (FSM 2672.42). This BE also complies with Section 7 of the ESA, which requires all federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), to insure that their actions are not likely to jeopardize the continued existence of threatened, endangered or proposed species or adversely modify their habitat.

Current management direction on desired conditions for Threatened, Endangered, Proposed and Sensitive species on the Bighorn National Forest can be found in the following documents:

- Forest Service Manual and Handbooks (FSM/H 2670/2609)
- National Forest Management Act (NFMA)
- Endangered Species Act (ESA)
- National Environmental Policy Act (NEPA)
- USDA Regulation 9500-4
- Bighorn National Forest Revised Land and Resource Management Plan, November 2005 (referred to as the Forest Plan) (USDA 2005)
- Species-specific recovery plans that establish population goals for recovery of those species
- Region 2 Conservation Assessments available at: http://www.fs.fed.us/r2/projects/scp/assessments/index.shtml
- Regional Forester policy and management direction (i.e., Sensitive Species List)

Viability for TES species on the Forest was assessed in the 2005 Forest Plan, FEIS, and associated documents. This analysis tiers to the analyses and species assessments conducted as part of the Forest Plan and incorporates them by reference. Any pertinent information available concerning a species' population or habitat trends were considered in the Forest Plan analyses, and there have been limited, if any, new information available since then. The disturbances anticipated from this project occur within the scope (extent, timing) of those analyzed in the Forest Plan FEIS. The following analysis describes any site specific details of this project relative to the TES species. There is no requirement within FSM 2670 to obtain population trends for each species considered.

The purpose of this Biological Evaluation (BE) is to identify likely effects of the proposed action to threatened, endangered, proposed, and Forest Service Region 2 sensitive wildlife species. The federally threatened, endangered, and proposed species to be addressed in this Biological Evaluation were identified in a species list (dated May 2009) received from the FWS. The biological evaluation addresses species that meet the following criteria:

1) Species that are known to occur on or near the Big Six Range AMP Project Area based on confirmed sightings.
2) Species that may occur on or near the Big Six Range AMP Project Area based on reliable unconfirmed sightings.
3) Based on the presence of potential habitat for the species on or near the Big Six AMP Project Area.

Forest Service Policy. - The Forest Service has developed policy regarding the designation of sensitive plant and animal species (Forest Service Manual (FSM) 2670; Supplement 2600-94-2). The most recent sensitive species list, designated by the Regional Forester, is dated June 2009. The sensitive species list contains taxa only when they meet one or more of the following three criteria:

1) The species is declining in numbers or occurrences and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend.
2) The species' habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline.
3) The species' population or habitat is stable but limited.

Forest Service Objectives. - Under FSM 2672.41, the objectives for completing BEs for proposed Forest Service programs or activities are:

1) To ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or animal species or trends toward Federal listing of any species listed as sensitive by Forest Service Region 2.
2) To comply with the requirements of the Endangered Species Act, actions of Federal agencies may not jeopardize or adversely modify critical habitat of federally listed species.

3) To provide process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process, and to enhance opportunities for mitigation.

FSM 2600, Section 2671.44 (Supplement 2600-94-2), provides direction on the review of actions and programs authorized, funded or implemented by the Forest Service relative to the requirements of the ESA.

Project Description

An Environmental Impact Statement (EIS) is the format for the National Environmental Policy Act (NEPA) analysis being conducted for this project. The 2005 Forest Plan includes an objective that livestock grazing, performed in a sustainable manner, would occur on the Forest. The Forest Service is analyzing proposed livestock grazing in six geographic areas (GAs) of the Forest in a manner that moves resource conditions toward meeting Forest Plan objectives and desired conditions. Prescribed burning would be added in alternative 3 for habitat improvement and reduction of fuels to help prevent large wildfires. The actions proposed develop allotment specific objectives and actions to meet Forest Plan goals, and to authorize management of livestock and construction of improvements that could result in meeting those objectives. The project also includes fuels management in the Shell Creek GA and the Little Bighorn River GA (Medicine Wheel/Paintrock Ranger District). The project is described in full detail in the EIS in Chapter 2. Table 1 below lists the allotments by geographic area considered in this analysis. Cumulative effects for this project were assessed in the EIS. This is incorporated by reference to this BE.

The three alternatives analyzed for this EIS:

1. Alternative 1: No grazing in the Big 6 AMP analysis area.
2. Alternative 2: No change to current grazing in the Big 6 AMP analysis area.
3. Alternative 3: Proposed alternative from scoping and analysis – Livestock grazing using adaptive management. Prescribed burning to enhance vegetative condition. Spike moss treatment, and other proposed actions as outlined in Chapter 2, Alternative 3 description.

In addition to the range management direction, the Forest Plan (2005) also provides direction for wildlife and TES resources that pertain to the proposed action, that were incorporated into the project design. These are as follows:

1) TES Objective 1.b. Pg. 1-2; Strategies 1 and 2 Pg. 1-3.
1) TES Standard #3. Pg 1-40.
2) Wildlife Guideline #1, #3, #5, #7, #10. Pgs 1-46 to 1-47.
3) Rangeland Vegetation Guideline #5. Pg 1-31.

Table 1. Allotments within Geographic Areas for the Big 6 Allotment Management Plan

Shell Creek GA, Beaver Creek watershed, Med. Wheel/Paintrock Ranger District	
Antelope Ridge Sheep and Goat (S&G)	Bear/Crystal Creek S&G
Beaver Creek (S&G)	Finger Creek Cattle and Horse (C&H)
Grouse Creek S&G	Hunt Mountain S&G
Little Horn S&G	Red Canyon S&G

Red Canyon C&H
Sunlight Mesa C&H
Whaley Creek S&G
Wiley Sundown C&H
Matthews Ridge C&H
South Park C&H

Goose Creek GA, Goose Creek watershed, Tongue Ranger District

Big Goose C&H
Little Goose C&H
Little Goose Canyon C&H
Walker Prairie C&H
Rapid Creek C&H
Stull Lakes C&H
Tourist Horse Special Use Permit,

Little Bighorn River GA, Little Bighorn River watershed, Medicine Wheel/Paintrock Ranger District

Fisher Mountain C&H
Red Springs C&H
Little Horn C&H
Wyoming Gulch C&H
Sage Basin C&H

Little Bighorn River GA, Little Bighorn River watershed, Tongue Ranger District

Dry Fork Ridge C&H
Lake Creek C&H
Lower Dry Fork C&H
West Pass C&H

Piney Creek/Rock Creek GA, Rock Creek watershed, Powder River Ranger District

Rock Creek C&H

Tensleep Creek GA, Tensleep Creek watershed, Powder River Ranger District

Dry Tensleep C&H
Garnet Creek S&G
Hazelton S&G
Leigh Creek S&G
McLain Lake S&G
Monument C&H
North Canyon C&H
South Canyon C&H
Tensleep Canyon C&H
Upper Meadows S&G
Willow S&G
Baby Wagon S&G

For the purposes of this document, these allotments will collectively be referred to as the Big 6 allotments. The allotments are administered by the Tongue, Powder River, and Medicine Wheel/Paint Rock Ranger Districts, with the exception of Matthews Ridge and South Park, which include national forest system (NFS) land within the allotment boundaries but are administered by the Worland District of the Bureau of Land Management (BLM) as pastures of BLM allotments (per a coordinated management agreement dated 4/25/1985). This analysis and decision will apply to the NFS lands within the Matthews Ridge and South Park allotments. The allotments in the six GAs cover 392,922 acres. Under the Forest Plan, the area is comprised of management units as shown in Table 2.

Table 2. Management area allocations for the six geographic areas (in acres).

	Management Area	***Acres***
1.11	Pristine Wilderness	26302.86
1.13	Semi-primitive Wilderness	7285.80
1.2	Recommended Wilderness	15577.65
1.31	Backcountry Recreation, Nonmotorized Use	7960.81
1.32	Backcountry Recreation, Nonmotorized Summer Use with Limited Winter Motorized Use	27048.55
1.33	Backcountry Recreation with Limited Summer and Winter Motorized Use	4337.37
1.5	National River System - Wild Rivers	10993.75
2.2	Research Natural Areas	6006.73
3.31	Backcountry Recreation, Year-round Motorized Use	11738.04
3.4	National River System – Scenic Rivers (Outside Wilderness)	2891.25
3.5	Plant and Wildlife Habitat Management	39683.10
4.2	Scenery	22750.09
4.3	Dispersed Recreation	19007.12
4.4	Recreation Rivers	31055.81
5.11	Forest Vegetation Emphasis	70471.46
5.12	Rangeland Vegetation Emphasis	15306.96
5.13	Forest Products	29189.71
5.4	Plant and Wildlife Habitat	11150.15
5.41	Deer and Elk Winter Range	181.15
5.5	Dispersed Recreation and Forest Products	2033.76
8.22	Ski-based Resorts, Existing/Potential	26302.86
MW	Medicine Wheel National Historic Landmark and Vicinity	7285.80

PRE-FIELD REVIEW

A pre-field review of the Project Area was conducted in May 2007 and reviewed with updated data in February 2008. Wildlife and insect species occurrences were obtained from records including the Wildlife Observation System (WOS) (Wyoming Game and Fish Dept 2008) and the Wyoming Natural Diversity Database (WYNDD 2008). Additionally, a review of the Hunt Mountain Travel Management Plan (signed May 30, 2007) analysis was conducted since that review included a majority of this project area. Results indicated that greater sage grouse (*Centrocercus urophasianus*), Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*), bald eagle (*Haliaeetus leucocephalus*), Northern goshawk *(Accipiter gentiles),* Northern harrier (Circus cyaneus), olive-sided flycatcher *(Contopus borealis),* and one unconfirmed historic sighting of a Canada lynx (*Lynx canadensis*) have been documented as occurring in the vicinity of the project area.

FIELD REVIEW

A large portion of the Beaver Creek portion of the project area was surveyed during the Hunt Mountain Travel Management Plan EA surveys in summers of 2004 and 2005. Field inventories for wildlife were conducted in the summer of 2007 and 2009, and track surveys in winter 2007-08. Field surveys targeted amphibians, water voles, northern goshawk, bats, marten/lynx in winter tracking, owls, bighorn sheep, sage-grouse, and sage canopy cover measurements. Sage-grouse were observed on Matthew's Ridge and South Park. Field surveys expanded into the remainder of the project area in 2009 by wildlife seasonals, targeting water voles and bats. All other surveys failed to detect the targeted species.

Sagebrush canopy cover transects were done in 2007 to ground truth GIS maps built on vegetation surveys by the Forest Service. The vegetation coverage accurately displayed sagebrush in the sagebrush cover type; however, it incorporated limited portions of existing sagebrush into a grassland cover type. Therefore, GIS maps underestimated sagebrush habitat within the project area. Sagebrush canopy cover transects also displayed higher sage canopy cover than GIS maps. The 100 transects ranged from 26.1-48.7% of sagebrush canopy cover. Forty-four percent of the analysis area is comprised of mountain grassland and sagebrush plant communities. Sagebrush canopy cover is well above recommended guidelines by either the Wyoming Interagency Vegetation Committee (2002) or Connelly (2000). Increased sagebrush reduces forb production and probably has negatively impacted approximately 11,000 acres of sagebrush habitat. Goodrich (1999) estimated a 3.8% decrease in understory herbaceous production for every 1% increase in Wyoming big sagebrush canopy cover over 15%. Currently 98% of sagebrush communities within the project area have canopy cover greater than 15%. Other large components are Douglas-Fir and Spruce-Fir communities. These communities may have missed typical fire cycles and have many pockets of dead or dying trees from insect and disease. Potential for large wildfire in this area is high as demonstrated by the Bone Creek Fire of 2007. As older stands of conifer continue to die from drought and/or beetle infestations, prescribed fire could create uneven aged timber stands so that they persist in the future and are able to continue to provide thermal cover. This could also reduce fuels and potential for large wildfires. Historically there were large stands of aspen on the west side of the project area. Few remnant stands still exist. Habitat improvement through mechanical removal of conifer encroachment and/or treatment with prescribed burning could help maintain and expand the existing stands of aspen.

THREATENED, ENDANGERED, CANDIDATE, AND PROPOSED SPECIES - Analysis of Habitat and Effects

A threatened (T), endangered (E), and proposed (P) species list was obtained from the FWS for the Forest in 2011 (USDI-FWS). The list for wildlife included Canada lynx (T) (*Lynx canadensis*), and the Greater sage-grouse (*Centrocercus urophasianus*) (Candidate).

Since receipt of that list, the greater sage grouse has been found to be "warranted but precluded" from listing by the FWS. Until this species becomes proposed for listing under the ESA, the Forest Service will continue to evaluate and manage for the species as a sensitive species, which is analyzed below according to sensitive species policy.

The gray wolf was analyzed in the Forest Plan FEIS Biological Assessment and is not included on the USFWS 2009 list of species to analyze for projects on the Forest. This is due to the fact that the 1994 listing action described areas outside of the recovery area as "non-essential, experimental", which includes the Forest, and that no extra management direction was required for Forest Plans

outside of the recovery area. The Forest Plan BA noted that wolf depredation killing has occurred on the Forest and would likely continue in association with domestic livestock grazing. This project is within the context of the Forest Plan BA, including the scope and extent of likely effects on wolves and other resources. This project analysis incorporates the Forest Plan BA analysis by reference, and this species will not be analyzed further in this document.

In 2003, the Forest consulted with the USFWS to have the mountain plover removed from the species list that the Forest receives for project analyses. This was based on literature and observation record reviews, GIS modeling of potential habitat, surveys in marginal potential habitat (no high quality plover habitat was identified), and finally a field review by the USFWS expert on mountain plover, Fritz Knopf. His recommendation was that the Forest did not possess any potential habitat. The species was dropped from all other lists for the Forest until 2010, when it reappeared, as this finding had been forgotten due to change in staff. The Forest shared the same information again to have this species removed from the list which was reflected in the 2011 list received. There have never been any plovers seen on the Forest, nor is there potential habitat. There would be no effects of this project to this species.

The Forest consulted with the FWS in 2000 regarding Canada lynx and effects of forest-wide activities within Lynx Analysis Units (LAUs) and again in 2005 with the Revised Forest Plan. Both consultations found the Forest's activities, from a programmatic perspective, to "may affect, not likely to adversely affect" the lynx. The Forest does not currently manage for lynx, as the Forest is currently considered to be "unoccupied" as identified in the Revised Forest Plan Biological Assessment (Appendix F to FEIS) and the 2005 Lynx Conservation Agreement, and the Northern Rockies Forest Plan Lynx Amendment (USDA Forest Service 2007). This analysis tiers to the Forest Plan FEIS analysis and incorporates it by reference. **Table 3** summarizes the findings for Canada lynx, with rationale and analysis in the following section.

Table 3. Effects determinations for T&E species.

T&E species	**Alternative 1**	**Alternative 2**	**Alternative 3**
Canada lynx	No effect	No effect	No effect

<u>Canada lynx</u> (*Lynx Canadensis)*

Status: Threatened.

The lynx was listed as threatened in March, 2000 (USDI 2000). The Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000) was developed in advance of the listing, and an Interagency Conservation Agreement was developed to implement the recommended conservation measures in the document (USDA 2000). These documents, in conjunction with Ruggiero et al (1999), describe details of the known lynx range, ecology, habitat, and management implications, and are incorporated by reference.

While historical observations of lynx have been known on the Forest, it is not known if lynx were ever a self sustaining population on the Forest. There is speculation that perhaps they used the Forest during periods of population "highs" from other core areas of habitat in the Rocky Mountains. The Forest conducted hair snare surveys in 2000-2002 in the northern 1/3 of the Forest with no detections of lynx (Malloy 2002). Two unconfirmed sightings of lynx occurred on the Forest during the winter of 2002/2003. A lynx released in Colorado as part of

reintroduction efforts travelled through the Bighorns in 2005 on its way into Montana. Additionally, track surveys were conducted during the winters 2003-2004 and 2005-2007 adjacent to the project area. No lynx tracks were found.

Lynx, should they occur on the Forest, would likely primarily use the high elevation spruce/fir and lodgepole pine forests where snowshoe hares are abundant prey, with red squirrel as secondary prey. Mapping efforts to delineate potential habitat was conducted in 2000 and updated in 2007 with the FWS, with Lynx Analysis Units (LAUs) being identified (FWS 2000). There are approximately 6825 acres of potential habitat within the project area on the eastern and north east sides. The Bone Creek fire of 2007 regenerated approximately 1488 acres.

Habitat: Extensive tracts of dense forest with bogs, rocky outcrops, and thickets are the preferred habitat type of lynx. Lynx locate their dens in forested areas with rocks, hollow trees, dense windfalls, or natural cavities in ground. Lynx generally require dense boreal forest with good prey base, such as snowshoe hare and red squirrel, among others. The Forest is not listed as critical habitat by the FWS.

Occurrence: In Wyoming, the lynx is rare. Dispersal and reproductive success is closely tied to snowshoe hare population fluctuations. On the Bighorns, there have been 5 sightings between 1969 and 1988. The 1969 record was from an adult killed near South Piney Lakes. Three sightings in 1970, 1972, and 1981 were from trapper records, and were located in Pole Creek, Flatiron Lake, and Seven Brothers Lakes, respectively. The 1988 sighting is earmarked in WYNDD as an unlikely record, and occurred near Highway 14A and Forest Road 15. There are no other records of lynx sightings within this analysis area.

Management: This species is vulnerable to fragmentation of suitable habitat and over trapping. The loss of large tracts of wilderness, its dependence on a principle prey source, hunting pressure, development, and predator control are all thought to be factors in the decline in lynx populations.

Determination: All alternatives would not affect LAUs or potential key linkage by grazing. Alternatives 2 and 3 grazing management practices are within the standards and guidelines in the Northern Rockies Lynx Amendment Direction and the Revised Forest Plan. Furthermore, the FWS found that livestock grazing would have no effect or discountable effects to lynx (USDI 2007). Also, this species is forest-dependant and the livestock management as proposed would have no effect on forested habitats or on regeneration of trees on disturbed sites.

Proposed prescribed burning in Alternative 3 would not occur within any existing LAUs. Prescribed fire would not measurably reduce lynx habitat and would be beneficial to prey for long term management. Prescribed fire would help maintain a diversity of forested age class structures.

Based upon no effects or discountable effects by grazing and minimal disturbance from proposed prescribed fire, there would be no direct or indirect effects to the lynx from any of the alternatives. Based on a reduction of travel to only designated routes from the Hunt Mountain Travel Management Plan, the reduction or maintenance of existing routes especially

considering the frequency of use, no known occurrence of the species in the project area, and maintenance and linkage of lynx habitat there would be no cumulative effects. Should a lynx occur in the project area, it would likely avoid any potentially disturbing project activities. As the Forest is unoccupied by lynx, and would continue to provide potential habitat for lynx, there would be **no effect** to this species.

Forest Service Sensitive Species

In addition to the FWS species list, Forest Service sensitive species are listed on the Region 2 sensitive species list last updated by the Regional Forester in 2011, including a matrix showing which species should be considered in analysis on the Forest. Sensitive wildlife species that have the potential to occur on the Bighorn NF are included in **Table 4** below. Rationale for determinations listed in **Table 4** are based on current literature on management related effects, and known or suspected occurrences. The analysis for these species also tiers to and incorporates by reference the analyses conducted for the Forest Plan FEIS, including species assessments, ecosystem and single species analysis, the Biological Evaluation (Appendix K to FEIS), and the viability determinations made in the FEIS (Chapter 3, Biological and Habitat Diversity section). Determinations in Table 4 apply to all actions unless otherwise stated. Additional information for certain species for which a "may impact" determination was made follows the table. The individual project areas column in the table refers to the Tensleep (T), Goose (G), Rock (R), Little Horn (LH), and Beaver Creek (B) geographic areas that are associated with individual allotments.

While the three-toed woodpecker was dropped from the sensitive species list in 2011, this document was initially prepared using the 2009 list, and as such the analysis for this species was not removed as the Forest will need to change its Forest Plan Appendix C list of emphasis species in order to include it as a "local concern" species. Similarly, while the Forest provides potential habitat for the hoary bat, which is a new addition to the 2011 sensitive species list, this species was analyzed in the wildlife specialist report for this project originally and now has a dual reference in this Biological Evaluation.

Rocky Mountain Bighorn Sheep are not included in this analysis. A separate Biological Evaluation was prepared for that species that also supplements the Forest Plan FEIS Biological Evaluation due to the complexity of the analysis involved.

Determination of "no impact" is explained and evaluated to contain one or more of the following criteria:

1. Habitat is absent or lacks vital components inside activity areas, making it unsuitable for occupancy or use by the species.
2. The action area is located outside the species' current known geographic or elevation range.
3. Proposed activity or disruption effects would occur outside of an animal's seasonal occupancy of otherwise suitable habitat.
4. No elements of a species' primary habitat or life requisites would be changed by the proposal which would detrimentally affect this species or its habitat.
5. Individual animals may be accidental, dispersing or migrating to the project area affected by the proposal, but no affiliation or dependence upon these areas is known.
6. An absence of trapping, hunting, sighting, carcass, photographic or other records in the last 50 years indicates local extirpation of the species is likely, the Wyoming Natural Diversity

Database (WYNDD 2008) identifies the species as “extirpated” in the county (counties) where the proposal is located, and/or published reports indicate the species is not present locally.

7. Project design criteria have been developed that would effectively reduce any potential for impact to ‘No Impact’.

Table 4. Forest Service Region 2 Sensitive species occurrences and habitat within Big 6 AMP project area.

Species	Potential Habitat within Project Area	Individual Project Area	Rationale & Effects for All Actions
Amphibians			
Columbia Spotted frog *Lithobates luteiventris*	Y	NA	These frogs are currently known to only the Tongue drainage on the Forest. While there is limited potential habitat in the project area, there is no currently occupied habitat based on surveys for these species. The few possibly suitable wetland habitats that do exist were surveyed in August 2005 and 2007 with no amphibian detections. There would be no direct or indirect effects to the species or occupied habitat from any alternative. Ongoing cumulative effects outside the project area including game fish and management related effects (recreation, grazing, roads, etc) could continue to limit dispersion into potential habitat. A recent species assessment was completed for the spotted frog, which this analysis considered (USFS 2007). Determination is "**no impact**" from any of the activities/alternatives proposed with this project.
Northern leopard frog *Lithobates pipiens*	Y	G, T	These frogs are known to occur at several locations on the Forest, with known observations near Meadowlark Lake and in the Goose Creek drainage. The few possibly suitable wetland habitats in Beaver Creek drainage that do exist were surveyed in August 2005 and 2007 but found no amphibians. Potential habitat exists in most of the project area drainages. It is thought that frog distributions are limited by game fish distribution, possibly by climate or disease factors, or other ongoing cumulative effects including livestock grazing, recreation, roads, or other riparian area disturbances. Livestock can directly and indirectly affect habitat through removal of riparian vegetative cover and affecting water quality, which may influence predation or other life factors for this species. It is not likely that livestock grazing results in significant direct mortality to individuals, though some individuals could be trampled. A species assessment was recently completed for the leopard frog, for which this analysis considered the information in that assessment (USFS 2007). Alternative 1 would provide less risk to potential habitat for this species with the absence of grazing. Alternatives 2 and 3 would likely maintain potential habitat and existing populations through the application of grazing standards and guidelines, with likely a quicker timeframe for riparian recovery in some sites with Alternative 3. Grazing conducted within the standards and guidelines for vegetation use should maintain adequate habitat for this species. Populations have persisted in all known locations on the Forest with ongoing cumulative effects, and this project would not increase cumulative effects. Prescribed fire in Alternatives 2 and 3 would likely have no effect on potential habitat as seldom are riparian areas burned severely enough to affect watershed function, and may even serve to increase water available if transpiration is reduced. Wildfire would continue to be likely under any alternative, with similar effects. With the ongoing cumulative effects likely being the largest determinant of frog populations and distribution, the determination for this species for all alternatives is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".

Wood frog *Lithobates sylvatica*	Y	G	These frogs are known to several areas of the Forest, although the only known location in the project area is in the headwaters of the Goose Creek drainage. The effects and rationale for this species would be similar to those described for the leopard frog. Determination is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".
Birds			
American Peregrine Falcon *Falco peregrinus*	Y	T, B	There are two known nesting sites on the Forest, one in Shell Canyon, and the other in Tensleep Canyon. Nesting habitat is cliffs/rock walls or steep canyons adjacent to large riparian areas. Foraging habitat related effects would be the only potential impact to this species. As the peregrines are fairly generalist in their foraging (small to medium birds taken in flight), it is not likely that any of the alternatives would have a measurable effect on the birds or their prey. Grazing alternatives 2 and 3 being considered are not impacting the lower reaches of Shell Canyon, nor the lower reaches of Tensleep Canyon that would be closest to nesting habitat and the prime areas of foraging. Grazing conducted within standards and guidelines under alternatives 2 and 3 should maintain foraging habitat for the species. The Bone Creek Fire of 2007 in Shell Canyon did burn some foraging habitat, but the peregrines remained around the nest after the fire. No prescribed fire or mechanical treatment activity is proposed that would affect peregrine nesting (indirect from smoke or direct on rocks) or that would affect declines of prey (indirect). No cumulative impacts are occurring such that any management activities on the Forest are likely hindering nesting or foraging. Raptor protection measures in the Forest Plan would be followed regardless of alternative selected. Determination is "***no impact***".
Greater Sage-grouse *Centrocercus urophasianus*	Y	T, B	Refer to the additional information described following this table. The determination for this species is ***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***". This determination is consistent with the prediction of effects in implementing the Forest Plan as described in the Plan FEIS and its appendices and associated species assessment.
Flammulated owl *Otus flammeolus*	Y	N/A	Possible occurrence on Forest in mature/old growth conifer forest (typically Ponderosa pine/aspen) though no known observations documented despite limited surveys. Primarily insectivorous and nests in snags. Prescribed burning could both reduce and create more snags, with no net loss. If prescribed burning occurred during the summer season, there could be displacement of individuals, though this would be in the short term. Habitat would remain over the long term. Other effects and determination would be similar as described for the northern goshawk.
Boreal owl *Aegolius funereus*	Y	All	Typically associated with old-growth conifer forest types, primarily in spruce-fir and aspen, which occur at the upper elevations of the project area. Likely occurs on the Forest, though only two observations known, with possible nesting. It is estimated that implementation of alternative 3 would result in the creation of many snags suitable as nesting sites, but may impact potential nesting sites. However, prescribed burning may also not occur during nesting season as this species nests in earlier spring. Effects by alternative to the species would be similar to those described for the northern goshawk. Determination is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".

Short-eared owl *Asio flammeus*	Y	All	Ground nesting species known to occur on the Forest in meadows/shrub communities. There are observations from the northeast corner of the Forest in the Little Bighorn drainage, and in the southeast corner of the Forest in the Powder River and Doyle Creek areas, as recorded in the WYNDD and WOS databases (2008). These may be breeding observations. No observations have occurred in Merrill (1997) or in the BBS routes on the Forest (Sauer et al 2001). Downing (1990) considers them uncommon residents in open habitats on the Forest.There is potential habitat present within the project area. This species will typically use more mosaic sage brush areas and edges of open areas with grass (Holt and Leasure 1993). Effects and determination for this species would be similar to the sage grouse.
Northern harrier *Circus cyaneus*	Y	All	Known to occur on Forest in meadows/shrublands in several areas, and is considered a more common raptor. Prefers grasslands and marshes. Feeds mainly on rodents. Generally roosts on the ground or perches on very low objects such as fence posts or tree stumps. Cattail and weedy marshes, open grasslands are preferred habitat. Cumulatively throughout the species' range, overgrazing of pastures has reduced prey availability and thus the amount of suitable habitat for this species. This species has been shown to reduce use of livestock-grazed grasslands. Activities which affect forested cover types, such as those proposed in alternative 3, appear to have no effect on this species. Effects and determination for this species would be similar to those described for the sage grouse. Nesting habitat, if found during implementation, would be protected by implementing raptor protection guidelines in the Forest Plan.
Northern goshawk *Accipiter gentilis*	Y	All	Known to occur in mature conifer and aspen habitat on Forest, with possible nesting occurrences in the project area. Surveys occurred for this species in old growth habitat in 2005 and 2007 and 2009 with no goshawks found. The nearest known nest is lower in elevation to the south in Shell Canyon in the Beaver Creek portion of the project area. Should an active nest be found, standard mitigation procedures as identified in the Revised Plan based on Reynolds (1992) would apply, including ID Team identification of appropriate nest stand and post fledging family area temporal and spatial restrictions. This would only apply under Alternative 3 where prescribed burning, mowing, or timber treatment near structures could disrupt nesting. There is some potential for prescribed burning to remove potential nests, although most burning would likely be outside of the nesting season, and mimics a natural process to provide a more balanced occurrence of age class in forested vegetation. Approximately 670 acres of potential habitat would be proposed for burning out of the 7500 acres of potential habitat available, which is a minimal potential effect, and helps maintain habitat in the long term as recommended by Reynolds (1992). No prescribed burning or other vegetation management in alternatives 1 and 2 could also affect habitat indirectly by allowing mature vegetation conditions to exist in the Little Horn and Beaver Creek areas. This may result in forested and sagebrush stands that may be less resilient to wildfire and have more widespread fire. Cumulative effects may occur for this species such as recreation or other timber/fuels activities that could be within the project area and potentially disturb nesting. With the possibility of burning or other activities causing a disruption to nesting in alternative 3, and with the possibility of indirect effects of no treatment in alternatives 1 and 2, the determination is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***". This determination is consistent with the prediction of effects in implementing the Forest Plan as described in the Plan FEIS and its appendices and associated species assessment.

American three-toed woodpecker *Picoides dorsalis*	Y	All	Typically found in old growth spruce-fir habitat, especially burned over, blowdown, or beetle killed stands. Known to occur throughout the Forest. No three-toeds were observed during project area surveys in 2005. Mature spruce-fir habitat does exist within and adjacent to the project area. Some habitat is proposed to be treated in alternative 3 through prescribed fire and a very limited amount of thinning around structures, but this would likely be outside of the breeding season for this species and would not directly or indirectly impact nesting. Potential habitat could be directly affected by the prescribed fire, however this would also serve to provide a more sustainable or balanced range of habitat availability in the long term by creating more age class diversity in a largely over-mature stand setting. Cumulative effects from potential wildfire would occur with all three alternatives. Livestock grazing would have no effect on this species or its habitat. Alternatives 1 and 2 would have the least likelihood of any effects to the species, while alternative 3 would have the most. As prescribed fire is mimicking a natural process, the effects are discountable. With the amount of habitat available throughout the Forest and project area in mature spruce/fir, the few acres proposed in alternative 3 would be negligible to the overall habitat for this species. The determination is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".
Lewis' woodpecker *Melanerpes lewis*	Y	LH	Prefers mature ponderosa pine forest with associated aspen and lower elevation riparian areas, nesting in cavities and feeding on insects. Known to occur only on the fringe of the Forest at lower elevations, with only low potential for occurrence in the very lowest portion of the Little Horn canyon. There would be no effect to this type of habitat, directly or indirectly, through any alternatives. Livestock grazing is not known to have an effect on the species, and prescribed burning would not be targeting ponderosa pine communities. Cumulative effects are not likely to be occurring on the forest or associated with any management activities, though a lack of wildfire may be the largest influence on this species' habitat. Determination is "***no impact***" for all three alternatives.
Olive-sided flycatcher *Contopus borealis*	Y	All	Known to occur on Forest in mature conifer and forages in forest openings or disturbed mature forest conditions (fire or blowdown areas) using snags on edges of forest openings. There are likely occurrences in the project area, though there are no known observations. Some potential habitat is proposed to be treated through prescribed fire, however not likely during breeding season. This would be a short term effect, but a long term improvement. Effects and determination would be similar to those assessed on the three-toed woodpecker.

Brewer's sparrow *Spizella breweri*	Y	LH, T, BC	Known to occur in sagebrush habitats on the Forest. Uses early to late shrub stages having an abundant understory of herbaceous vegetation and brushy cover. They occur forest-wide as documented in most of the known survey publications including the two routes of Breeding Bird Survey results (Sauer et al 2001), Merrill (1997), Downing (1990), Wyoming Observation Database (2002), Beels (1996), and RMBO (2005). They are one of the more common avian species found in sagebrush habitats in Wyoming (Ingelfinger 2001). There are currently no known population estimates or trends for the species on the Forest, which can exhibit fluctuations depending on insect populations and habitat and climate related functions. Initial estimates from the monitoring conducted by RMBO indicate a mostly stable trend over the five years (Hanni, 2009). Breeding Bird Survey trends indicate a downward trend on both the Bald Mt. and Crazy Woman routes. Effects and determination for this species would be similar to those described for the sage-grouse (Paige and Ritter 1999). In addition, alternative 3 has design criteria to accompany mechanical sagebrush treatments to restrict the season of treatment to outside the April 16 through July 15 period to provide nesting protection for this and other sagebrush obligate species.
Loggerhead shrike *Lanius ludovicianus*	Y	LH, G, R	Known to occupy lower elevation grasslands on the Forest, though primarily known to east side of the Forest. There is potential habitat in the project area. Effects to this species would be similar to those described for the greater sage grouse.
Harlequin duck *Histrionicus histrionicus*	Y	LH, T	Historic and one recent observation (2005) on Forest. Forest is on edge of known range. No historic or current observations in project area. Potential habitat in the project area may include the Tensleep, Little Horn, or other large boulder substrate in fast moving streams. There could be a potential indirect effect to habitat from livestock grazing or other vegetation management activities that would have the potential to affect water quality. Alternative 1 would have the least potential for this effect, and alternatives 2 and 3 would be similar to each other in potential for effect. With the lack of known observations of this species in the project area, and the well armored condition of its habitat from potential disturbances, the determination is "***no impact***".
Grasshopper sparrow *Ammodramus savannarum*	Y	BC, T, LH	Known to occur in grass/sagebrush habitats on the Forest. Effects and determination would be similar to those listed for the sage-grouse. In addition, alternative 3 has design criteria to accompany mechanical sagebrush treatments to restrict the season of treatment to outside the April 16 through July 15 period to provide nesting protection for this and other sagebrush obligate species.
Sage sparrow *Amphispiza bellii*	Y	BC, T, LH	Suspected to occur in lower elevation sagebrush habitats on the Forest, but presence on Forest has not been confirmed. Review of habitat preferences indicates that potential habitat may exist within the analysis area at lower elevations. The effects and determination for this species would be similar to those described for the greater sage grouse. In addition, alternative 3 has design criteria to accompany mechanical sagebrush treatments to restrict the season of treatment to outside the April 16 through July 15 period to provide nesting protection for this and other sagebrush obligate species.

Bald Eagle *Haliaeetus leucocephalus*	Y	All	Known to only use the Forest as foraging habitat during migrational periods. No winter roosting or nesting is known to occur on the Forest. Eagles are typically sighted in the late fall at high mountain lakes or near the Forest boundary, foraging. Typical winter roosting habitat is mature cottonwood riparian galleries, a rare occurrence on the Forest. There would be no direct or indirect effects to eagles based on the season of use for livestock grazing or prescribed burning or other vegetation treatment, and the species is highly mobile if burns are occurring. Cumulative effects on the Forest or immediately adjacent to it (within 1 mile) have not been known to affect eagle populations. There would be no difference among alternatives for this species. Raptor protection measures in the Forest Plan would be followed. Their prey base is diverse and foraging behavior is widespread, such that any potential impacts from livestock grazing would similarly have no or discountable effects on habitat. Determination is **"no impact".**
Mollusks			
Pygmy mountainsnail *Oreohelix pygmaea*	Y	All	The Forest contracted a researcher in 2010 to provide information on this and other mollusk species (Anderson, 2010). Findings of the report indicate that there are taxonomic questions with the Pygmy snail that may not be addressed for some time. The species found on the Forest seems to be the Cooper's snail, described below, as determined by genetic testing. Numerous locations were sampled, with snails found at almost every sample location, with good abundance. Previously, the species was only known from two locations on the Forest. There were no known ongoing habitat impacts to the species identified. This species was a new addition to the list since the Forest Plan, however existing direction in the plan allows for adequate management emphasis and options for this species, with no additional direction required. Research will likely continue for this species. Habitat is currently thought to be associated with forested canyons, in large boulder dominated riparian areas below 8,000'. Prescribed burning may alter habitat (direct effect), however it is a natural process for which the species is likely adapted. Prescribed burning would not likely take place in forested riparian areas that may be preferred habitat, however wildfire could easily occur in these areas. There are no other proposed timber stand alterations in potential habitat with the project, as fuels reductions would be at higher elevations near cabin sites that are not in riparian areas. Livestock grazing is not likely a habitat effect to the larger boulder dominated forested riparian, as livestock spend little time in these types of riparian areas, and would only indirectly affect habitat or individuals, if at all. Due to the unknown effects of livestock grazing with this species, it would be likely that the effects for any alternative are similar, though there would presumably be less potential impact with Alternative 1. However, since little is known of this species, numerous populations were found in surveys, and potential cumulative effects of fire or recreation use also occur, the determination for all 3 alternatives is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".

Cooper's Rocky Mountainsnail *Oreohelix strigosa cooperi*	Y	All	Potential habitat is likely similar to the Pygmy snail, and this species may be the only known to occur throughout the Forest, rather than the Pygmy (Anderson, 2010). Effects would be similar to those described for the Pygmy snail. Determination would be the same as for the Pygmy snail.
Mammals			
North American wolverine *Gulo gulo*	Y	All	Infrequent occurrence on Forest (primarily historical observations), most likely in wilderness or remote unroaded areas, in both mature conifer or alpine meadows or rock fields. Project area likely has minimal potential habitat due to lack of high alpine in roadless type areas. Project disturbances in alternatives 2 and 3 (grazing and prescribed fire or other vegetation treatments) would immeasurably disturb potential use of habitat above that which is already occurring from other cumulative effects (e.g. recreation). There may be less human disturbance in the project area under alternative 1, however it is unknown if this would create more potential habitat. Due to this species' high wandering potential, it is not likely that any direct, indirect, or cumulative effects on the Forest are having a measurable effect on this species, as it has never been known to use the Forest as a part of its core habitat. Cumulative effects off Forest are more likely the more influencing factors on this species. With the unknown occurrence of this species on any regular basis, and the relatively low amount of cumulative effects on the Forest to potential habitat (e.g. recreation and prescribed fire), the determination is **"*no impact*"** for all three alternatives**.**
American marten *Martes americana*	Y	All	Known to occur fairly widespread on Forest in mature conifer particularly near streams, primarily in lodgepole and spruce-fir types. Cumulative effects occur throughout the Forest, such as from recreation may displace individuals, or timber/fuels/wildfire activities that can alter habitat and displace individuals. However, these activities are not currently known to affect populations or distribution, as disturbances are small scale, and a predominance of mature conifer habitat, particularly in forested riparian areas, persists. Livestock grazing is not known to affect measurably any habitat or potential prey. Alternative 1would have no effects other than ongoing cumulative effects. Alternative 2, with livestock grazing at current levels would likely have minimal, if any affects. Alternative 3 with proposed habitat improvements through prescribed fire could cause short term displacement of individuals and indirectly affect prey abundance. However, long term improvement to habitat is likely to create a more balanced age class distribution of conifer habitat that may prevent widespread losses of habitat through wildfire. Proposed burning would not likely take place during breeding season, further reducing potential effects. With the ongoing cumulative effects the determination for this species for each alternative is **"*may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide".***

Townsend's big-eared bat *Corynorhinus townsendi*	Y	T, LH	Known to occur on Forest in caves. Possible potential habitat in the Tensleep and Little Horn drainages, though none known to caves in those drainages. Caves adjacent to the project area have also been monitored in 2005 and 2007 with no bats detected. Primary impact to habitat and individuals is likely from recreational caving, a cumulative ongoing effect. There would be no direct or indirect effects from any of the alternatives to potential habitat due to a lack of known locations in the project area. Livestock grazing can indirectly affect prey (insects) for bat species, as could vegetation management projects (prescribed burning or other disturbances) that alter foraging habitat. Livestock grazing conducted within forest plan direction would likely continue to provide potential foraging habitat. With a lack of observations, and minimal if any potential effects to potential foraging habitat, it is not likely that there is a difference among any of the three alternatives for this species. No adjacent caves would have any disturbance from any of the proposed actions. Determination is **"*no impact*"** for all three alternatives.
Spotted bat *Euderma maculatum*	Y	T, LH	No observations currently known on Forest. Nearest confirmed occurrence is south of Hwy 16 off the Forest to the Southwest. No suitable habitat of cliffs, rock outcrops, mines, or caves to be disturbed with proposed activities. No known occupied caves in or adjacent to project area, only potential habitat. No adjacent caves would have any disturbance from any of the proposed actions. Effects and determination is similar as described for the big-eared bat.
Fringed myotis *Myotis thysanodes*	Y	T, LH	Known to occur on Forest. Not known within the project area. The nearest confirmed location is near Cottonwood Creek outside of the project area. No known occupied caves in or adjacent to project area, only potential habitat. No adjacent caves would have any disturbance from any of the proposed actions. Effects and determination is similar ad described for the big-eared bat.
Hoary bat *Lasiurus cinereus*	Y	All	Likely to occur on Forest, though currently only known adjacent to Forest. As a cavity nesting species, proposed actions in alternative 3 involving prescribed burning or other conifer treatments could reduce habitat in the short term through direct removal or modification of habitat. However, with an abundance of mature forested habitat remaining across the Forest, this would not likely be a significant effect. There are no likely significant cumulative effects for this species as the amount of forested vegetation being treated annually on the Forest is less than 2,000 acres per year. Due to uncertainty in the scale of effects and the unknown occurrence on the Forest, the determination for this species is "***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***".
Water Vole *Microtus richardsoni*	Y	All	Refer to the additional information described following this table. The determination for this species for all three alternatives is ***may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide***". This determination is consistent with the prediction of effects in implementing the Forest Plan as described in the Plan FEIS and its appendices and associated species assessment.

Note – Short term effects are considered less than five years unless otherwise noted.
Project Areas: B – Beaver Creek, LH – Little Horn River, G – Goose Creek, R - Rock Creek, T – Tensleep Creek

ADDITIONAL INFORMATION REVIEW FOR WILDLIFE

Listed below are the Region 2 Sensitive wildlife species that are known or expected to occur within the project area, for which additional information other than what was presented in the table applies.

BIRDS

Greater sage-grouse, *Centrocercus urophasianus*.

Status: Region 2 Sensitive. Recently found to be "warranted but precluded" for listing under ESA (USDI FWS, 2010). The Forest Service, along with other federal agencies, is currently in the process of developing a conservation agreement with the USFWS for this species.

Habitat: Inhabits sagebrush-dominated rangelands, summering in the foothills and wintering on the plains. Prefers areas where sagebrush provides 15 to 50 percent of the ground cover. Depends entirely upon forms of sagebrush, primarily big sagebrush, for food from October through May and for cover throughout the year.

Occurrence: There have been confirmed sightings within parts of the project area at South Park and Matthew's Ridge allotments and near Bald Mountain. Also, sage grouse are known to use portions of the Tensleep drainage, including South Canyon C&H and possibly Dry Tensleep C&H. The Forest is only known to have late summer brood-rearing habitat for sage-grouse. No known winter or breeding/leks occur within the project area or adjacent to them. Nearest known lek is 2-3 miles west of the project area from Matthew's Ridge and 3-4 miles from the rest of the Beaver Creek area, and similar distances from the Tensleep portion of the project area. A monitoring flight was conducted in the spring of 2005 to determine lek or early season use of the Forest, and no birds or sign of habitat use were found. Most habitat adjacent to the Forest is on steeper ground, indicating that sage grouse likely move through this area transitionally. Sage canopy cover is dense in the approximate one mile area west of the Forest boundary, with the exception of the two allotments in Tensleep Canyon where adjacent land (private) habitat treatments have occurred resulting in mixed canopy cover conditions.

Management: The following guidelines (Connelly et al 2000 or Wyoming Interagency Vegetation Committee 2002) pertain to all seasonal habitats used by sage-grouse, and were considered in the development of forest-wide direction for the Revised Plan. General goals and objectives include the effort to eliminate any noxious weeds, and to treat adequate amounts of sagebrush to maintain a diversity of age class structures at the landscape scale.

1. Monitor habitat conditions and only propose treatments if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines under habitat protection). Do not base land treatments on schedules, targets, or quotas.
2. Use appropriate vegetation treatment techniques (e.g., mechanical methods, fire) to remove junipers and other conifers that have invaded sagebrush habitat. Whenever possible, employ vegetation control techniques that are least disruptive to the stand of sagebrush, if this stand meets the needs of sage-grouse.
3. Increase the visibility of fences and other structures occurring within 1 km of seasonal ranges by flagging or similar means if these structures appear hazardous to flying grouse (e.g., birds have been observed hitting or narrowly missing these structures or grouse remains have been found next to these structures).
4. Avoid building powerlines and other tall structures providing perch sites for raptors within 3 km of seasonal habitats. If these structures must be built, or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites.

Summer/Late Brood-rearing Habitat Management

Sage-grouse may use a variety of habitats including meadows, farmland, dry lakebeds, sagebrush, and riparian zones from late June to early November. Generally, these habitats are characterized by relatively moist conditions and many succulent forbs in or adjacent to sagebrush cover. Brood-rearing habitat should be managed generally to provide sagebrush with 10-25% canopy cover, with 15% of the canopy in grass and forbs. This should be provided on the landscape scale, with > 40% of the area meeting this description.

Habitat protection

1. Avoid land use practices that reduce soil moisture effectiveness, increase erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs.
2. Avoid removing sagebrush within 300 m of sage-grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve habitat management objectives (e.g., meadow restoration).
3. Discourage use of highly toxic organophosphorus and carbamate insecticides in sage-grouse brood-rearing habitats. Sage-grouse may be adversely affected by pesticide applications (Blus et al. 1989). Less toxic agrichemicals or biological control may provide suitable alternatives in these areas.
4. Avoid developing springs for livestock water, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may adversely affect wet meadows used by grouse for foraging.

Habitat restoration

1. Use non ground disturbing mechanical treatments in strips 4-8 m wide in areas with relatively high shrub canopy cover (>35% total shrub cover) to improve late brood-rearing habitats. Brush beating can be used to effectively create different age classes of sagebrush in large areas with little age diversity. Mechanical treatment of sagebrush should not occur from April 16 through July 15.
2. If brush beating is impractical, use fire or herbicides to create a mosaic of openings in mountain big sagebrush and mixed shrub communities used as late brood-rearing habitats where total shrub cover is >35%. Generally, 10-20% canopy cover of sagebrush and <25% total shrub cover will provide adequate habitat for sage-grouse during summer, if provided over 40% of the landscape area.
3. Only construct water developments for sage-grouse in or adjacent to known summer use areas and provide escape ramps suitable for all avian species and other small animals. Water developments have not been constructed solely for sage-grouse on the Forest due to the adequate distribution of water.
4. Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats.

Table 5. Estimated existing conditions and desired conditions using Wyoming Interagency Vegetation Committee 2002 recommendations for Vasey and Big Mountain Sagebrush within Beaver Creek AMP project area.

Desired Condition		Existing Condition (estimated)	
Canopy cover class	Percentage of landscape	Canopy cover class	Percentage of landscape
0-5%	10-20	0-5%	0
5-20%	20-30	5-20%	2

>20%	30--50	>20%	98

Maintain > 20% herbaceous spp.
Maintain > 70% ground cover

Under Alternative 3, approximately 1,500 acres of treatment of sagebrush could be treated to be within Wyoming Interagency Vegetation Committee 2002 guidelines for the Beaver Creek portion of the project area. Some future maintenance may be needed to maintain these guidelines. The Hunt Mountain Prescribed Burn EA is still effective within this project area. By using the recommended guidelines, that decision would comply with these guidelines as well. Appendix A of this report displays representative examples of dense sagebrush canopy cover within the project area (Beaver Creek portion of the area). The proposed prescribed burning in the Little Horn area would not likely be within any areas currently used by sage grouse. There would be no proposed treatments for the Tensleep Canyon area under this project, which has known sage grouse occurrences, as those areas were covered in separate NEPA analysis (Southwest Fuels).

Effects: There would be no effects from livestock grazing or vegetation treatments under Alternative 1. However, wildfire may occur more readily in this alternative and runs a risk of being more widespread and of higher intensity which would create a longer recovery period for sagebrush, given the current dense canopy cover throughout the Beaver Creek portion of the project area. Under Alternative 2, livestock grazing conducted at standards and guidelines should maintain habitat for the species, as it has been currently occurring, with ongoing direct and indirect effects to existing habitat. The direct effects include removal of grass vegetation, which may provide cover for grouse. Indirect effects could be to foraging, with grazing reducing grasses and forbs that may support insect populations that are consumed by grouse. Conversely, grazing typically results in greater sagebrush canopy cover, also used for cover and forage by these species. Wildfire potential in Alternative 2 would be similar to Alternative 1. Under Alternative 3, more consistent adherence to livestock grazing standards and guidelines would be more readily possible with adaptive management strategies. Sagebrush treatment proposed in Alternative 3 would follow WGFD recommended management for Vasey Big Sagebrush and Mountain Big Sagebrush (Wyoming Interagency Vegetation Committee 2002), which also incorporate the Connelly et al guidelines (2000) from the Revised Forest Plan, to ensure maintenance of habitat diversity and adequate habitat for the sage-grouse. Sage-grouse may be displaced for the short term during sagebrush treatment activities, though prescribed fire treatments would not likely occur when sage-grouse are present in mid summer months. Long term benefits in a more balanced distribution of sagebrush canopy cover would be likely with Alternative 3. Sage grouse and their habitat would be directly or indirectly affected by the vegetation management activities. However, prescribed burning is typically done under cooler conditions than when wildfire occurs, reducing the severity of the burn and speeding recovery of sage canopies and understory species. While mechanical sagebrush treatments are restricted during April 16 through July 15, prescribed burning would not be restricted. This is due to narrow prescribed burn weather opportunities, and the limited amount of acres treated with prescribed fire in a given year (less than 2,000), which would not serve to impact grouse over a large enough area to justify restricting its application. Cumulative effects are more likely the dominant effect in this species' abundance and distribution, largely influenced by activities within 2 miles of known leks, as indicated in literature. Cumulative effects on the Forest include recreation activities, besides the mentioned livestock and fire management activities. Recreation, through camping or hiking or the very limited amount of hunting for this species, may displace grouse. These

effects and the following determination are consistent with the species assessment and the determination made in the Forest Plan FEIS for this species, and that analysis is incorporated by reference for this project.

Determination: Considering the above mentioned effects, the determination for this species is that the project, regardless of alternative, **may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide**. While there is short term risk with the proposed action, there are also long term benefits to sage-grouse habitat. The no-action alternative (alternative 1) and the no change alternative (alternative 2) would result in a "no impact" determination in the short term. However, long term effects of increased sagebrush would reduce herbaceous production and could negatively impact sage-grouse habitat. Goodrich (1999) estimates a 3.8% decrease in understory herbaceous production for every 1 % increase in Wyoming big sagebrush canopy cover over 15%. Currently 89% of sagebrush communities within the project area is over 15%. Without sagebrush treatment, there is a greater chance of widespread canopy cover removal occurring through wildfires.

MAMMALS

Water vole, *Microtis richardsoni*.

Status: Region 2 Sensitive.

Habitat: Inhabits riparian, cottonwood-willow, marshes, wet alpine meadows, and grass-sedge areas. Prefers wet sites such as stream sides. Uses tunnels and burrows in dense willow or herbaceous vegetation. Does not occur in conifer dominated riparian zones. It appears from the literature that overhead cover from grasses, sedges, and willows must be at least 75% for habitat to be suitable.

Water voles are very selective for small, narrow patches of riparian habitat adjacent to alpine and sub-alpine streams, within 5 to 20 meters of stream edges. Inhabited sites range from 3,000 to 10,500 feet in elevation (primarily above 8,000 feet on the Forest) and stream banks with deep, well-drained soils are preferred. Water voles are very mobile underwater and burrow entrances are often built below the surface. Water voles remain active throughout the winter. They feed primarily on leaves and stems of forbs, as well as grasses, sedges, roots, bulbs and seeds to a lesser extent (Klaus and Beauvais 2004).

Occurrence: Water voles are known in the project area from observations documented in WOS or WYNDD, primarily from previous surveys done by Klaus and Forest personnel. Most records on the Forest are from the North Tongue drainage, adjacent to the project area. Extensive surveys in 2005 and again in 2007 failed to detect any new populations of voles within the project area. Potential habitat occurs in each project area as mapped in the Forest Plan FEIS species assessment, which was used to help determine potential survey areas.

Management/Effects: Water voles have a relatively short breeding season, small litter sizes and short life spans. Site fidelity is high and seemingly suitable habitats in adjacent areas are often unused. The high degree of site fidelity limits the exchange of genetic material between local populations and occupied habitats can become isolated from each other when sufficient vegetative

cover is not present. These factors make local populations vulnerable to habitat disturbance and long-term extirpation. Concentrated use by livestock in riparian areas can reduce habitat quality through direct effects by changing the quality and quantity of riparian vegetation and causing soil compaction and bank sloughing which indirectly affect burrow placement or availability. Direct effects to individuals by trampling from grazing are not likely, but possible. Indirect effects of long term heavy grazing can result in changes in stream cross-sections and wide, shallow streambeds may preclude occurrence of this species. Cumulative effects are possible from recreation use (fishing access, dispersed camping) or roads that are located in riparian areas, and wildlife ungulate browsing/grazing (e.g. moose). It is not known if livestock grazing is limiting populations to their current location and extent, or if the species is not as mobile at colonizing new potential habitat. Prescribed fire or other vegetation treatments do not typically affect the main riparian corridor as this wet habitat will not burn, neither is it targeted in mechanical type sagebrush treatment or other activities.

Determination: Alternative 1 would have the least potential risk to water voles and their habitat, and would likely result in the quickest recovery or colonization of potential habitat. Alternative 2 would presumably maintain voles in their current distribution and habitat quality, with some risk of long term habitat decline considering other cumulative effects. Alternative 3 with adaptive management would be more likely to result in improved riparian habitat in a shorter timeframe than alternative 2. Livestock grazing that is conducted within Forest Plan standards and guidelines is estimated to provide suitable habitat for voles as described in the Forest Plan FEIS and associated analyses. The proposed prescribed burning and other vegetation treatments in Alternative 3 would likely have no direct or indirect effects on voles or their habitat, as these activities are not conducted in the narrow riparian area that defines their habitat.

The determination for this project, with all three alternatives (given cumulative effects) is **may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide** on water voles or their habitat. This determination is consistent with the anticipated effects as analyzed in the Forest Plan FEIS and associated assessments.

FOREST PLAN CONSISTENCY DETERMINATION

The alternatives, as described above, are consistent with applicable Forest-wide threatened, endangered, sensitive species and wildlife standards and guidelines defined within the Bighorn National Forest Land and Resource Management Plan Revised Forest Plan (USDA Forest Service 2005). Two of the species considered in this BE were not addressed in the Forest Plan BE, BA, or other emphasis species documents. These include the Cooper's and Pygmy mountain snails. Both of these species were surveyed for on the Forest in 2010. Consideration of this initial survey and researcher recommendations indicate that the existing framework of management direction in the Forest Plan is adequate to provide habitat needs for these species, particularly as provided in TES Standard #3 (p. 1-40). Due to the overall stability of the habitats in which these species were found (large substrate riparian areas and forested settings), no supplement to the Forest Plan BE is necessary at this time, unless further information found indicates a need.

In addition to the rationale provided under the analysis for each species, this analysis was found to be within the range of anticipated effects for each of the species as described in the Revised Forest Plan FEIS, to which this analysis is tiered.

SUMMARY OF DETERMINATIONS

Threatened species

Canada lynx: any alternative would have **no effect**.

Forest Service sensitive species: Determination of **no impact** for the alternatives considered:

Amphibians*:* Columbia spotted frog.

Birds: American peregrine falcon, flammulated owl, harlequin duck, bald eagle, Lewis' woodpecker.

Mammals: North American wolverine, Townsend's big-eared bat, spotted bat, and fringed-tailed myotis.

Forest Service sensitive species: Determination of **may adversely impact individuals or habitat, but is not likely to result in a loss of viability of populations on the Forest, nor cause a trend to federal listing, or a loss of species viability range wide** for the proposed alternative

Amphibians: Northern leopard frog and wood frog.

Birds: greater sage-grouse, boreal owl, short-eared owl, northern harrier, northern goshawk, American three-toed woodpecker, olive-sided flycatcher, Brewer's sparrow, loggerhead shrike, grasshopper sparrow, sage sparrow.

Mammals: American marten, hoary bat, water vole.

Invertebrates: Cooper's Rocky Mountain snail, pygmy mountain snail.

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Appendix A – Examples of Sage Brush Canopy Cover within the Beaver Creek Range AMP Project Area
Top: Spring Creek, 08/07/2007, Bottom: South Park, 07/11/2007